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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,675	12/17/2001	Isao Ota	111483	5111
25944	7590	12/15/2004		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER UMEZ ERONINI, LYNETTE T	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/015,675

Applicant(s)

OTA ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 10-18 is/are pending in the application.
- 4a) Of the above claim(s) 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 10-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/17/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-3, 10 and 11-18, drawn to an abrasive sol, classified in class 252, subclass 79.1.
  - II. Claim 11, drawn to method of making an abrasive, classified in class 451, subclass 1<sup>+</sup>.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case process as claimed can be used to make other and materially different product such as a sol comprising additional components that excludes lanthanum and neodymium.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group I, restriction for examination purposes as indicated is proper.

5. Applicant provisionally elected with traverse, Group I, claims 1-3 and 11-18, which are drawn to a sol composition in response filed 2/17/2004.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

7. Newly submitted claim 11 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 11 is directed to a method of making an abrasive containing a sol which is independent of claims 1-3, 10, and 12-18, which are drawn to a sol composition.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 10 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Drawings***

8. The Examiner acknowledges and accepts the drawings filed on 12/17/2001.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsu et al. (US 4,769,073) in view of Aozasa (US 6,171,572 B1).

Tatsu teaches an admixture with a solution of a cerium salt, an aqueous solution of a salt of at least one trivalent rare earth, which includes lanthanum, praseodymium, and neodymium (column 4, lines 14-29) and lists a composition comprising: ceric oxide, lanthanum oxide, and neodymium oxide and having a mean particle diameter of  $1.5 \pm 1$   $\mu\text{m}$ , in and EXAMPLE 1 (column 12, lines 13-37). Tatsu discloses ceric oxide in the form of the composition described in French Pat. No. 2,549,846 and such compositions comprise a crystallographic phase of  $\text{CeO}_2$  type . . . and corresponding to the formula

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$\text{Ln}_{2-x}\text{Ce}_x\text{Si}_2\text{O}_7$  in which . . . x is greater than or equal to 0 and less than 2" (column 5, lines 7-15). The aforementioned reads on,

A sol in which particles are dispersed in a medium, wherein the particles comprise as a main component crystalline cerium oxide of the cubic system and as an additional component a lanthanum compound, neodymium compound or a combination thereof and encompasses wherein the additional component is contained in  $X/(\text{Ce} + X)$  molar ratio of 0.005 to 15 in which X is lanthanum atoms, neodymium atoms or a combination thereof, **in claim 1**;

wherein the additional component is a lanthanum compound, **in claim 2**;

wherein the additional component is a neodymium compound, **in claim 3**;

Tastu differs in failing to teach have a particle size of 50 to 150 nm, **in claim 1**.

Aozasa teaches, ". . . a cerium sol having an average colloidal particle size of 3 to 100 nm, and optionally one or more members selected from the group consisting of salts of yttrium, scandium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, magnesium, calcium, barium, aluminum, titanium, and hafnium . . ." (column 3, lines 49) and ". . . a cerium sol having an average colloidal particle size of 3 to 100 nm, preferably 5 to 80 nm, more preferably 10 to 50 nm. . . . If the average colloidal particle size is smaller than 3 nm, production in industrial scale will be difficult" column 5, lines 52-59).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify the combination of abrasive materials as taught by Tastu, by using Aozasa's sol having a particle size of 3 to 100 nm which falls within the

particle size range as claimed by applicants for the purpose of ease of production in industrial scale (Aozasa, column 5, lines 59-60).

12. Claims 10 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsu et al. (US 4,769,073) in view of Aozasa (US 6,171,572 B1).

Tatsu teaches an admixture with a solution of a cerium salt, an aqueous solution of a salt of at least one trivalent rare earth, which includes lanthanum, praseodymium, and neodymium (column 4, lines 14-29) and lists a composition comprising: ceric oxide, lanthanum oxide, and neodymium oxide and having a mean particle diameter of  $1.5 \pm 1 \mu\text{m}$ , in and EXAMPLE 1 (column 12, lines 13-37). Tatsu discloses ceric oxide in the form of the composition described in French Pat. No. 2,549,846 and such compositions comprise a crystallographic phase of  $\text{CeO}_2$  type . . . and corresponding to the formula  $\text{Ln}_{2-x}\text{Ce}_x\text{Si}_2\text{O}_7$  in which . . . x is greater than or equal to 0 and less than 2" (column 5, lines 7-15). The aforementioned reads on,

An abrasive containing sol in which particles are dispersed in an aqueous medium, wherein the particles comprise as a main component crystalline cerium oxide of the cubic system and as an additional component a lanthanum compound, neodymium compound or a combination thereof and encompasses wherein the additional component is contained in  $X/(\text{Ce} + X)$  molar ratio of 0.005 to 0.15 in which X is lanthanum atoms, neodymium atoms or a combination thereof, **in claim 10**;

wherein the additional component is a lanthanum compound, **in claim 12**;

wherein the additional component is a neodymium compound, **in claim 13**;

which is adjusted with an acidic substance to a pH of 1 to 6, (column ,lines )

Also, Tatsu teaches, a solution of the cerium salt, the basic solution and the aqueous solution of the salt the trivalent rare earth were characterized, such that the pH of the reaction medium range from 5 to 10 (column 5, lines 53- 66), which reads on, an abrasive, which is adjusted with a basic substance to a pH of 8 to 13, **in claim 15**.

As pertaining to claims 16-18, since Tatsu uses the same composition as claimed by applicants, then using Tatsu's composition in the same manner as in the claimed invention would respectively result in,

an abrasive, which is used for polishing a substrate, which comprises silica as a main component,

an abrasive, which is used for polishing a rock crystal, a quartz glass for photomask, a semiconductor device or a hard disk made of glass; and

an abrasive, which is used in a step of polishing an organic film, a step of polishing Inter Layer Dielectric (ILD) or a step of shallow trench isolation, for polishing a semiconductor device.

Tastu differs in failing to teach a sol in which particles are dispersed in an aqueous medium in a range of 0.1 to 50-wt%, **in claim 10**.

Since Tatsu discloses the same combination of sol components, which is known to be well adapted for rapid and efficient polishing of organic glass surfaces (Abstract) and which is claimed by applicants, then it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have been motivated to select any amount in terms of weight percent, including the specific wt% claimed by



applicants to accomplish a desired level of rapid and efficient polishing of organic glass surfaces.

Tastu also differs in failing to teach a sol wherein the particles have a particle size of 50 to 150 nm, **in claim 10**.

Aozasa teaches, "... a cerium sol having an average colloidal particle size of 3 to 100 nm, and optionally one or more members selected from the group consisting of salts of yttrium, scandium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, magnesium, calcium, barium, aluminum, titanium, and hafnium . . ." (column 3, lines 49) and "... a cerium sol having an average colloidal particle size of 3 to 100 nm, preferably 5 to 80 nm, more preferably 10 to 50 nm. . . . If the average colloidal particle size is smaller than 3 nm, production in industrial scale will be difficult" column 5, lines 52-59). Aozasa also teaches, cerium sol having a concentration of about 100 to 200 g/liter (~ 10 to 20 g/100 ml or 10-20 wt %), (column 6, lines 4-6).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify the combination of abrasive materials as taught by Tastu, by using Aozasa's sol having a particle size of 3 to 100 nm which falls within the particle size range as claimed by applicants for the purpose of ease of production in industrial scale and for the purpose of (column 8, lines 42-45).

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tastu (US '073) in view of Aozasa (US '572 B1), as applied to claim 10 above.

Tastu differs in failing to teach an abrasive, which is adjusted with an acidic substance to a pH of 1 to 6.

It is known that acidic solutions have pH of less than 7 and are used to lower the pH of a substance.

Hence it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ an acidic solution to Tastu abrasive composition for the purpose of lowering the pH of the composition.

#### ***Response to Arguments***

14. Applicants' arguments with respect to claims 1-3, 10-11, and 15-18 have been considered but are moot in view of the new ground(s) of rejection. Failure of the former prior art of record to teach a sol comprising a cerium oxide, and an additional component, a lanthanum compound, neodymium compound or a combination thereof, having a particles size of 50 to 150 nm, a range of 0.1 to 50 wt%, and a molar ratio of 0.005 to 0.15 contained in  $X/(Ce + X)$ , where X is lanthanum atoms, neodymium atoms or a combination thereof, as recited in claims 1 and 10, requires a new art rejection.

**Conclusion**

15. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Itue

December 12, 2004

NADINE G. NORTON  
SUPERVISORY PATENT EXAMINER  
